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ABSTRACT

The activities and projects of the National Library of Medicine are described. New and continuing programs in library services and operations, on-line computer retrieval services, grants for library assistance, audiovisual programs, and health communications research are included. International activities of the Library are outlined. Summary statistics of the Library's 1974 fiscal year activities are provided with comparable statistics from previous years. (DGC)

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The National Library of Medicine

Programs and Services
Fiscal Year 1974

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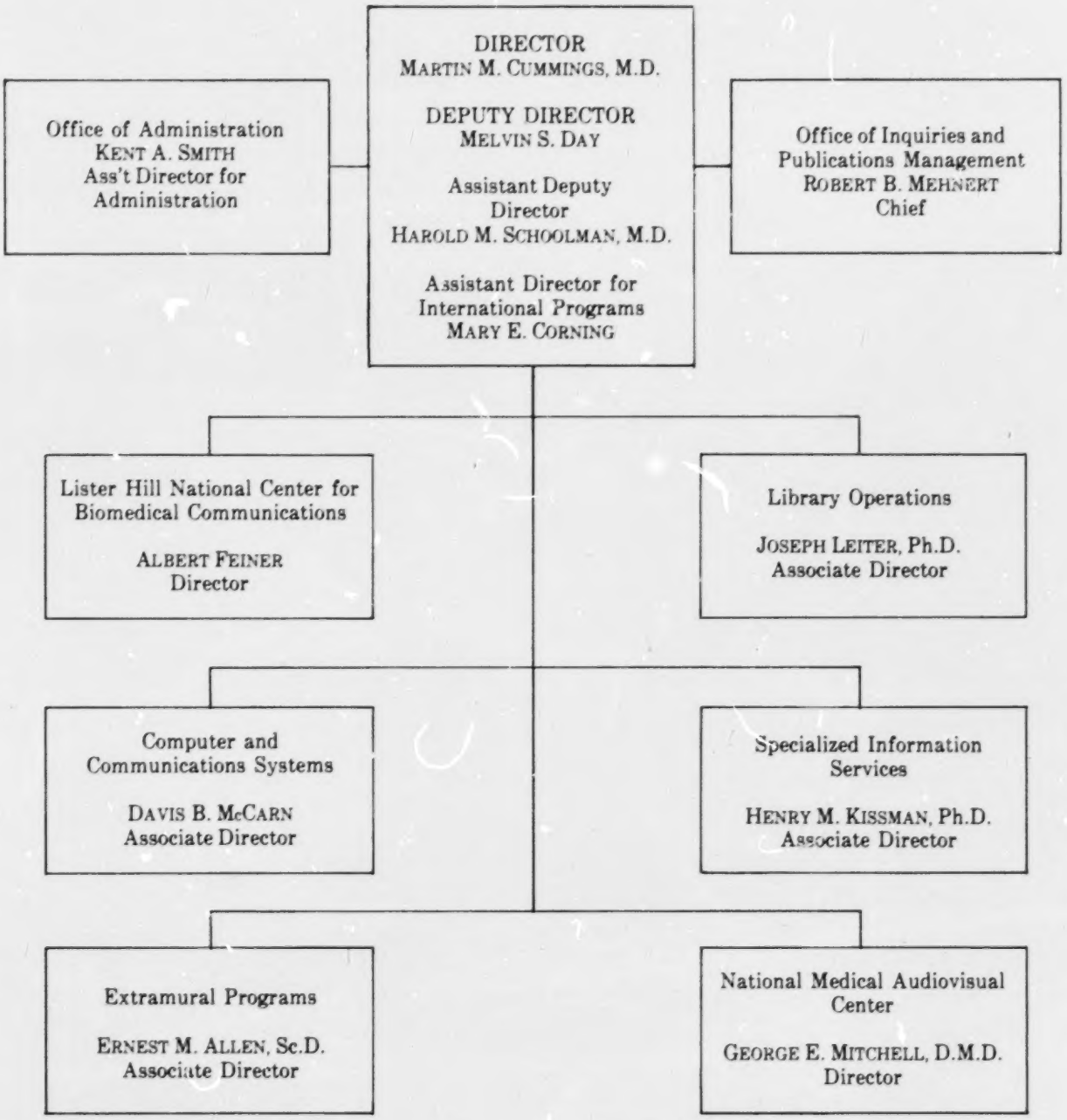
ORGANIZATION OF NATIONAL LIBRARY OF MEDICINE



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I. POLICY AND DIRECTION

Board of Regents

On March 8, 1974, following Senate confirmation, President Nixon appointed Joseph F. Volker, D.D.S., Ph.D., President of the University of Alabama, and Ethel Weinberg, M.D., Associate Dean of the Medical College of Pennsylvania, to four-year terms on the NLM Board of Regents. The Board, which meets three times a year, advises the Secretary of HEW on policy matters affecting the Library. Because the terms of John P. McGovern, M.D., and J. Stanley Marshall, Ph.D., expired in June 1974, the Board still stands at six appointed Regents, four less than the ten authorized by the National Library of Medicine Act.

At the June 1974 meeting, the outgoing chairman, Dr. McGovern, handed over the gavel to his elected successor, W. N. Hubbard, Jr., M.D. Dr. Hubbard is serving as chairman for the third time, having been elected to that position in 1965 and 1966 when serving his first term as a Regent. Dr. Hubbard, formerly dean of the University of Michigan Medical School, is President of the Upjohn Company.

The highlight of the June 1974 meeting was a special session of the Board to examine the National Library of Medicine: past, present, and future. All Regents chairmen for the past ten years, with the exception of Drs. Normal Q.

Members of the Board of Regents, June 1974, from left, top row: Dr. Martin M. Cummings, Dr. Joseph F. Volker, Dr. W. N. Hubbard, Jr., Dr. Angelo M. May, Brig. Gen. George E. Reynolds; center row: Capt. J. William Cox. Dr. John P. McGovern, Dr. J. Stanley Marshall; front row: Dr. Laurence V. Foye, Jr., Vice Adm. Donald L. Custis, Dr. Susan Y. Crawford, Mrs. Bernice M. Hetzner, Dr. Ethel Weinberg, Col. Mims C. Aultman, Mr. John G. Lorenz.

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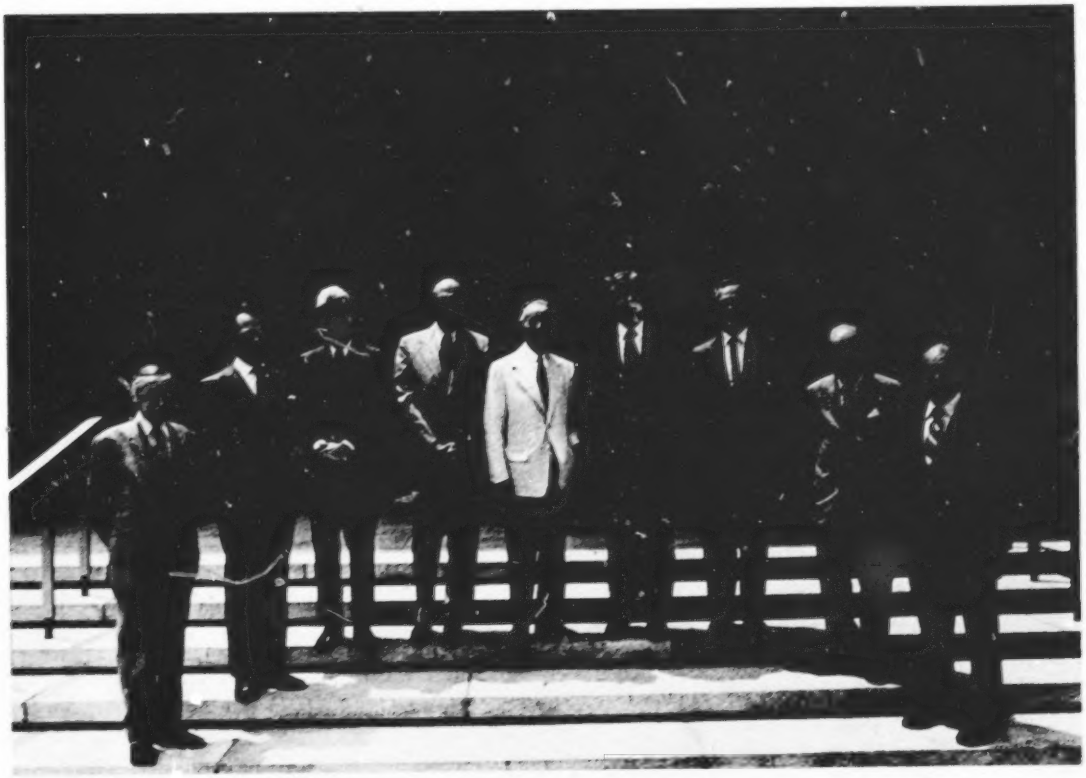
Brill and Robert H. Ebert, attended. Also present to make brief remarks about NLM's "unwritten history" was Worth B. Daniels, M.D., first chairman of the Board (1957).



Former Chairmen of the NLM Board of Regents gathered at the Board's 48th meeting to discuss the Library's past, present, and future. From left to right: Dr. Barnes Woodhall, Mr. Alfred R. Zipf, Dr. John P. McGovern, NLM Director Dr. Martin M. Cummings, Dr. Worth B. Daniels, Dr. W. N. Hubbard, Jr., Dr. Stewart G. Wolf, Dr. William G. Anlyan, and Dr. Jack M. Layton.

Staffing Activities

Personnel actions in FY 1974 numbered 834, including 60 promotions, 121 separations (including resignations, retirements, and transfers to other agencies), and 134 accessions. There were 34 employees enrolled in the NIH Upward Mobility College and four employees participated in other upward mobility programs during the year. A total of 320 requests for training were processed in FY 1974, including 142 for courses at nongovernmental facilities, such as local universities, and 178 for training through agency and interagency programs.

In accordance with a governmentwide employment reduction that occurred early in the fiscal year, the NLM personnel ceiling was reduced by 20 positions, from 466 to 446. NLM appealed this reduction to the NIH Office of the Director. In recognition of the need to sustain basic library services and make modest beginnings in the research and development programs, the NIH Director restored ten of these positions early in the fiscal year and ten more later in the year, thus returning the end-of-year ceiling to the FY 1973 level of 466 positions. Major staff changes during the year included the following:

In April 1974, James M. Stengle, M.D., was named Deputy Director for Medical Affairs of the Lister Hill Center. He joined NLM after serving in several branch chief positions in the National Heart and Lung Institute.

Also in April, George Cosmides, Ph.D., was appointed Deputy Associate Director for Specialized Information Services. He had

previously been Director of the Pharmacology Research Associate Training Program in the National Institute of General Medical Sciences.

Mr. Joseph Gantner was appointed Chief of the Technical Services Division, Library Operations, in December 1973. He came to NLM from the State University of New York at Stony Brook, where he had been Associate Director and Acting Director of Libraries. Mr. Gantner succeeded Seymour I. Taine, who left the Library in July 1973 to take a position with the World Health Organization in Geneva, Switzerland.

Joining Specialized Information Services in June as Chief of the Technical Files Implementation Branch was Michael Oxman, Ph.D. He was previously with the NIH Division of Research Resources where he served as a Program Officer in the Biotechnology Resources Branch.

Ernest M. Allen, Sc.D., Associate Director for Extramural Programs, officially retired from Federal service in June 1974. However, Dr. Allen continues serving in that position under a full-time temporary appointment.

Others retiring in June 1974 were Norman P. Shumway, M.D., Head of the MeSH Section, Bibliographic Services Division, and Leonard Karel, Ph.D., pharmacologist, Office of the Associate Director for Library Operations.

Table 1. Personnel Ceilings

	FY 1973	FY 1974	FY 1975*
Office of the Director	12	11	11
Office of Inquiries and Publications Management	6	5	5
Office of Administration	36	36	36
Office of Computer and Communications Systems	54	51	51
Extramural Programs	30	27	27
Lister Hill National Center for Biomedical Communications	17	20	20
Specialized Information Services	16	17	17
National Medical Audiovisual Center	103	100	100
Library Operations	192	199	199
TOTAL	466	466	466

*Estimated

Management of Financial Resources

In January 1974 the President submitted to Congress the Administration's budget for fiscal year 1975. The amount requested for the NLM was $27,738,000, an increase of almost $2 million over the FY 1974 appropriation but nearly $1.5 million less than the amount actually available for obligation in FY 1974. The reason for the wide divergence between appropriated and obligational levels was that in December 1973 the Federal Courts ruled that the Administration must release to the various agencies funds which had been impounded in the previous year; $3,338,000 were restored and made available for obligation by NLM in FY 1974.

In the spring of 1974, subcommittees of the House and Senate Appropriations Committees held hearings on NLM's FY 1975 budget request. Members of both subcommittees expressed considerable interest in the progress of the proposed Lister Hill Center building. On June 27, 1974, the House passed a bill including funds for the NLM; the Senate had not yet taken action by year's end. The House bill contained an increase of $312,000 over the President's budget request for NLM, the additional funds to be used for "staff support."

The Library continued to experience the pervasive effects of inflation in 1974, which, as in previous years, were more extreme in the publishing industry than in the Nation's economy as a whole. This had the dual effect of increasing the cost of literature acquisition to the NLM and of forcing many small libraries to curtail their own subscriptions to medical journals and rely more heavily on the NLM and the Regional Medical Libraries for loans and other services.

Table 2. Financial Resources and Allocations Fiscal Year 1974

Amounts Available for Obligation	
Appropriation, NLM	$25,871,000
Plus: Unobligated Balance Brought Forward, Start of FY 1974	3,365,000
Pay Cost Supplements	458,000
Earned Reimbursements	1,004,594
Less: Transfer of Funds to Departmental Management	36,000
Total	$30,662,594
Amounts Obligated by Extramural Programs	$ 7,689,000
Amounts Obligated for Direct Operations	
Lister Hill National Center for Biomedical Communications	$ 2,931,000
National Medical Audiovisual Center	4,518,000
Office of Computer and Communications Systems	3,682,000
Library Operations	5,632,000
Toxicology Information Program	1,747,000
Review and Approval of Grants	822,000
Program Direction	3,497,000
Subtotal, Direct Operations	$22,829,000
Total Obligations, NLM	$30,518,000

Lister Hill Center Building

Under the specific authority of Public Law 90-456, the planning for the Lister Hill National Center for Biomedical Communications facility began in FY 1970. When built, the facility will house the staff of the Lister Hill Center, the National Medical Audiovisual Center, Extramural Programs, Specialized Information Services, Office of Computer and Communications Systems, and certain components of Library Operations. This will make it possible to use most of the NLM building for library services and stacks, purposes for which it was designed. The new Lister Hill Center Building, to be located adjacent to the present Library, will be a ten-story tower with three underground levels.

Tentative working drawings were reviewed by NLM staff in March 1974 and comments were forwarded to the architect, Carroll Associates of Philadelphia, for consideration in developing the final working drawings. These are scheduled to be completed by January 1975. The project will be ready for issuance of invitation to bid on construction in FY 1975, pending the authorization of construction funds by Congress.

Security

During FY 1974 a complete review was made of the Library's safety and security program. George P. Morse and Associates, consultants in protection, conducted a survey and seminar on protection at the National Library of Medicine. As a result of recommendations made by the consulting firm and staff members of the Library, a new program of protection and safety was established. Some of the elements of the program which were instituted during the year include: development of an emergency evacuation plan; assignment to the Library of permanent guards and establishment of a special guard force training program; improvement of control over the collection and other property with an improved pass system; and evaluation of the need for an automatic access control system. A study of the feasibility of an improved fire protection system to safeguard the collection was also completed.

Awards and Honors

NLM Director, Martin M. Cummings, M.D., was the recipient of a 1973 Rockefeller Public Service Award, one of the most prestigious

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honors of its kind in the nation. Dr. Cummings was cited for his leadership in the Library's development of computerized bibliographic retrieval systems, and for the use of communications satellites in the transfer of biomedical information.

Princeton President William G. Bowen (left) presents the Rockefeller Public Service Award to NLM Director Dr. Martin M. Cummings. Sponsor of the award is John D. Rockefeller, III (right).

Two NLM employees were named to receive DHEW Superior Service Awards. Kent A. Smith, Assistant Director for Administration, cited for "exceptional competence as an administrator, unique and lasting contributions to the management of NLM, and dedication to the highest traditions of public service." Arthur J. Broering, Deputy Associate Director for Extramural Programs, was honored for his "considerable contributions to the guidance and development of the NLM grant programs and to the direction and growth of the Regional Medical Library System."

Mrs. H. Rita Orr, Personnel Management Specialist in the Office of Administration, received the NIH Equal Employment Opportunity Award for 1974, the first time the award has been given. Mrs. Orr was recognized for her "success in working with NLM supervisors and educational institutions which has helped produce an awareness of the capabilities and potentialities of the young employee and for her role as coordinator of the Stay-in-School and Summer Aide programs."

The fifth annual Regents Award for Scholarship or Technical Achievement went to Sharon L. Valley, Ph.D., pharmacologist in the Office of the Associate Director for Specialized Information Services. Dr. Valley was cited for her initiative and creativity in developing unique toxicology information products and services.

The Director's Award went to three employees for their exceptional achievements and contributions to the Library: Henry M. Kissman, Ph.D., Associate Director for Specialized Information Services; Mary E. Corning, Assistant Director for International Programs; and Norman P. Shumway, M.D., Chief, Medical Subject Headings (MeSH) Section, Bibliographic Services Division, Library Operations.

Copyright

On November 27, 1973, the U.S. Court of Claims ruled that making single copies of journal articles by NLM and the NIH library does not violate copyright laws. The judgment was in response to a petition filed on February 27, 1968, by Williams & Wilkins against the Federal Government. The petition alleged that NLM and the NIH library, by providing on inter-library loan single copies of journal articles for the use of health professionals, had infringed the journal publisher's copyright. The court's four to three decision in favor of the Federal Government overturned Commissioner James F. Davis's preliminary report filed in February 1972, which had recommended in favor of the plaintiff.

The court said that medical research would suffer if such photocopying were banned since "the supply of reprints and back numbers is wholly inadequate," and it is "wholly unrealistic to expect scientific personnel to subscribe regularly to large numbers of journals which would only occasionally contain articles of interest to them." The court also rejected the plaintiff's argument that he had suffered financial loss because of library photocopying.

The plaintiff has appealed the decision of the Court of Claims to the Supreme Court, which has agreed to hear the case. Arguments will be heard in the fall of 1974, with a decision coming probably in the spring of 1975.

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Exhibits

Two new exhibits were displayed in the Library's entrance foyer during the year. The first, "The Artist and Medicine," contained a varied selection of prints and drawings presenting artists' views on man's confrontation with sickness, pain, and death. The second, "Witchcraft and Medicine," dealt with witchcraft from the 15th through the 18th centuries, and included books and prints from the collection of NLM's History of Medicine Division.

"Base Hospital," a lithograph by George Bellows (1882-1925), was one of the works displayed in the exhibit "The Artist and Medicine."

Equal Employment Opportunity Activities

The Library has continued to follow the action steps and timetable contained in the 1973 Affirmative Action Plan. Among the significant events for FY 1974:

- The Director reaffirmed his commitment to providing opportunities for employees by reestablishing the Administrative Trainee position within the Office of Administration. The last trainee in this position, Mr. Bryant Pegram, is now serving as Administrative Officer, Office of Computer and Communications Systems.
- Within Library Operations, the Associate Director has been working with the EEO Committee to establish an in-house training program for five library technicians interested in qualifying as librarians. This training will give employees in paraprofessional positions knowledge to assist them in performing their daily work and, at the same time, increase their upward mobility by preparing them to take the Federal Librarian Examination.
- The NLM, in addition to increasing its participation in Project Stride, has also now begun to participate in Access, an upward mobility cooperative work-study program involving alternating periods of full-time work and full-time college attendance. The participants are students of local colleges and universities who are preparing for a professional career. This program is helpful in bringing minority group members and women into professional positions at NIH. All college fees are paid under the program. However, the student earns a salary only for the time he is actually working at NIH.
- The NMAC EEO Committee has been instrumental in developing a separate and comprehensive Affirmative Action Plan for NMAC.
- Elections were held for the new EEO Committee in September. Subsequently, Ms. Cecile Quintal, Serial Records and Binding Section, TSD, was appointed to chair the Committee.
- Efforts to inform NLM employees about the EEO program were highlighted by the distribution of an informative brochure prepared by members of the Communications Subcommittee.
- In May 1974, an Upward Mobility Programs forum was conducted at NLM to educate supervisors about these programs, including the on-campus Upward Mobility College.
- The NLM EEO Coordinator has been instrumental in recruiting minorities and women for professional-level positions at the Library. His office has also been engaged in developing a statistical profile of NLM employees to aid in identifying areas of the Library where recruitment efforts should be increased.

II. LIBRARY SERVICES AND OPERATIONS

The Library has continued to build resources to provide the necessary central back-up service for document delivery and bibliographic support to the Regional Medical Library Network. In addition, NLM is planning to develop and implement a management information system which will use the existing MEDLINE, SERLINE, and CATLINE data bases to generate network controlled document delivery systems which ultimately will be fully integrated with the bibliographic retrieval system of the network.

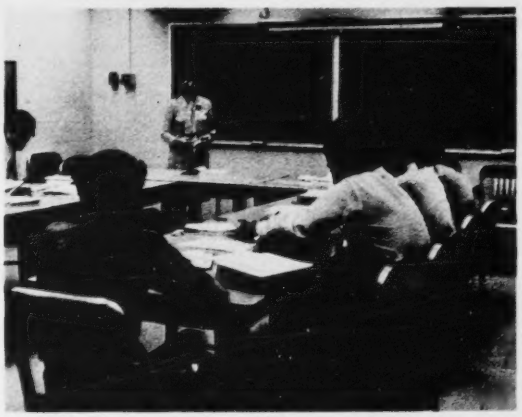
An extension of the traditional interlibrary loan services as we now know them was the initiation in FY 1974 of an experimental referral system between the National Library of Medicine and the British Library Lending Division in Boston Spa, Yorkshire. This experimental cooperative project—using the British Lending Library as backing for document delivery needs in the United States—is a resource sharing approach on an international level which may open a new extension of interlibrary cooperation.

NLM's involvement with the Library of Congress' Cataloging in Publication Program was expanded considerably during the fiscal year. The preparation of cataloging data for approximately 1,700 biomedical titles has almost doubled last year's output. The National Library of Medicine plans to continue and increase its contribution to this program.

As a result of cooperative programs with the Library of Congress, the Council on Library Resources, and other major academic libraries, agreement has been reached on adopting a modification to the standard Library of Congress MARC record format which enables NLM and other libraries to make their machine readable records compatible with MARC records generated by the Library of Congress. This development will make it possible to provide a linkage with the Ohio College Library Center which operates a large national library processing system and has the capability to make NLM's cataloging data available to network users.

NLM has also taken an active role in the development of a National Serials Data Base called CONSER (Conversion of Serials Data Bases). This development in resource sharing within the library community has evolved as an extension of the National Serials Data Program (NSDP), begun by the Library of Congress, NLM, and the National Agricultural Library.

Numerous training programs, including workshops, seminars, and courses of several weeks' duration were conducted by Library Operations to train librarians and information specialists in health sciences librarianship, in indexing methods, and in the techniques of online bibliographic searching. The Library Associate Program, now in its ninth year of operation, continued to prove popular with recent graduates of library science schools. Fifty-five candidates from 32 schools competed for the four Associate positions at NLM. The new training program will begin in September 1974. The one-year associateship provides opportunities for seminars, practical work experience, and project assignments, as well as formal presentations and individual study.



Training classes are held regularly at NLM for indexers and MEDLINE search analysts.

Bibliographic Services

During fiscal year 1974, 224,318 journal articles were indexed for MEDLARS. The Bibliographic Services Division, under whose direction all indexing is done, continued its primary functions of coordinating this world-

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wide effort and of maintaining an intensive quality control review procedure. In addition, by year-end, 25 percent of all indexing was performed by Division personnel.

Almost 225,000 journal articles were indexed in FY 1974.

More than 150 journal titles were added to the list of those indexed for MEDLARS. This was made possible as a result of the continuing review of all journals indexed, and the subsequent deletion of those whose quality had deteriorated. By the end of the year a total of 2,275 journal titles were being regularly indexed.

The day-to-day operation and management of the network of 235 libraries utilizing and offering the Library's on-line services continued to be a major activity of the Division. On-going publication of the monthly NETWORK/MEDLARS *Technical Bulletin*, generation of user manuals, and gathering and reporting of statistical data on system usage are representative of BSD's network management functions. In addition, five training courses on the operation of the Library's on-line systems were conducted under the auspices of the Division; 67 medical librarians attended these courses.

Table 3. Summary of Bibliographic Services

	FY 1972	FY 1973	FY 1974
Articles Indexed			
NLM	39,869	30,894	44,100
Other U.S.	120,739	74,276	74,001
Foreign	72,769	102,646	106,217
TOTAL	233,377	207,816	224,318
MEDLINE Searches	6,277	156,059	215,294
Recurring Bibliographies	24	24	24
Journals Indexed for *Index Medicus*	2,246	2,194	2,275

MeSH Section

In view of the greatly expanded activities of the Medical Subject Headings (MeSH) Section and its growing diversity of interactions outside the Bibliographic Services Division, an organizational change in January 1974 transferred the MeSH Section from the Division to the Office of the Associate Director for Library Operations.

Medical Subject Headings Section activity for the year was concentrated on preparing for the transition from MEDLARS I to MEDLARS II. The hierarchical organization of the subject headings was extensively reorganized to utilize the capability of having a seven-level structure where only four levels were previously possible. One hundred and seventy-five new terms were added to facilitate this change.

In November 1973, the MEDLARS I MeSH file was closed to further additions or changes in order to permit its conversion to MEDLARS II format. All subsequent additions and changes have had to be held in abeyance awaiting the availability of MEDLARS II input and file maintenance capabilities. These were not yet available at the close of the fiscal year.

Extended meetings with subject experts from the National Institute of Child Health and Human Development and Karolinska Institutet in Stockholm, Sweden, have led to the development of many new terms and cross references concerned with the biology of reproduction.

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History of Medicine

The History of Medicine Division continued to increase its resources for historical scholarship during the year. Three incunabula were added to the collection: Jacopo da Forli, *Expositio super primo Canonis Avicenne* (Venice, 1495; Goff J-52); Joannes de Janduno, *Questiones in tres libros De anima Aristotelis* (Venice, 1488; Goff J-353); and Alexander of Aphrodisias, *De anima ex Aristotelis institutione* (Brescia, 1495; Goff A-386). From later periods the Library added a wide range of materials, from such fundamental works in the history of science as Francis Bacon's *Instauratio magna* (London, 1620) and rarities such as the famous Leonhart Fuchs's *Alle Kranckheyt der Augen* (Strassburg, 1539), to 19th century Americana including an ephemeral "Circular and Catalogue" for Alden March's Practical School for Anatomy and Surgery in Albany, New York, 1835. Additions to the modern manuscript collection included some 2,000 items relating to the history of the Public Health Service from Dr. Ralph Chester Williams, the Archives of Alpha Omega Alpha, and the papers of Dr. William Bean. Manuscript material was also received from Drs. Esmond R. Long, W. Palmer Dearing, William S. Middleton, and Chauncey D. Leake.

The oral history collection continued to be enriched by transcripts of interviews by Dr. Milton Senn relating to the child development movement. A master index to the interviews, now totaling 83, is being prepared for the benefit of interested readers.

Dr. Faye G. Abdellah, Chief PHS Nurse Officer, and Dr. Anne Kibrick and Mrs. Margaret Walsh of the National League for Nursing, meet with Dr. Peter D. Olch, Deputy Chief of the History of Medicine Division, to discuss establishing a national repository of manuscript materials related to the development of the American nursing profession.

During the year, over 4,000 books, manuscript boxes, and oral history memoirs were provided to readers in the Library. Some 2,200 items were furnished on interlibrary loan or in photocopy and nearly 1,900 photographs and slides were supplied in answer to requests for pictorial material. To improve access to the collection, and in anticipation of future publications, near-

Table 4. History of Medicine Activities

	FY 1972	FY 1973	FY 1974
Acquisitions			
Books	1,265	936	1,142
Modern manuscripts	36,325	13,819	29,551
Oral history hours	43	52	40
Prints and photographs	479	1,100	565
Processing			
Titles cataloged	3,002	2,192	2,473
Modern manuscripts cataloged	20,362	45,890	20,900
Pictures indexed	571	526	355
Articles indexed	2,892	4,270	5,354
Pages microfilmed	153,441	160,220	148,952
Public Service			
Reference questions answered	2,113	1,936	1,865
ILL and pay orders filled	1,821	2,140	2,233
Reader requests filled	5,784	6,278	4,085
Pictures supplied	1,888	1,782	1,877

ly 2,500 books were cataloged. Library publications issuing from the History of Medicine Division included issue number 7 (1971) of the *Bibliography of the History of Medicine*. In addition, staff members published several articles in professional and scholarly journals.

Reference Services

Over 27,000 requests for reference and bibliographic assistance and almost 180,000 requests received for interlibrary loans during fiscal year 1974 added another notch to the steady rise in service demand.

The continued growth of the journal collection necessitated the shifting of seven years' holdings of each current title from the A to the C level of the building, filling that area to "working capacity" (75 percent of its shelving capacity). The shift, which required three months to accomplish, served to open up the current journal stacks on the A level, the area of greatest demand and activity.

The Division began a review of the security-classified government documents in its care, with the view to weeding out-of-scope items and requesting declassification to promote wider use.

The contract negotiated in fiscal year 1973 for archival microfilming of certain portions of the collection was renewed during 1974. The Library received almost 1,900,000 pages of material on film. In conjunction with this stepped-up preservation program, the Photoduplication Section undertook the in-house micropreservation filming of badly deteriorated items which could not safely be sent out for contract filming. The present goal for in-house filming is one million pages a year.

Toward the end of the year, the Division began testing access to computerized catalog data using cathode ray terminals, for identifying material cataloged since 1965. The system (CATLINE) is searchable by author, title, or subject, and a variety of terminal types are being tested for public use in the catalog area.

An experimental referral system for interlibrary loan service was successfully instituted between the Library and the British Library Lending Division located in Boston Spa, Yorkshire. Loan requests which could not be filled at NLM were telexed to Britain and photocopies of these articles were air mailed back for transmission to the requesting institution. The experiment will continue into 1975.

Dr. Jaroslav Nemec of the reference staff compiled an *International Bibliography of the History of Legal Medicine*, the first to appear on this subject with world-wide coverage since 1819. It is available through the U.S. Government Printing Office. Mrs. Joy Richmond, also a member of the reference staff, compiled and annotated the Second Supplement to *Medical Reference Works, 1679-1966*. The work was published by the Medical Library Association.

Table 5. Summary of Circulation Activities

	FY 1971	FY 1972	FY 1973	FY 1974
Number of Requests				
Received	218,982	241,824	256,715	262,733
Filled	186,144	193,009	194,341	205,894
For readers	83,585	72,892	70,430	66,895
By interlibrary loan	102,559	120,117	123,911	138,999
Photocopy	95,559	110,081	114,228	126,689
Original	7,000	10,036	9,683	12,310
Unfilled	32,838	48,815	62,374	56,839
Rejected and referred	9,273	10,558	12,228	14,082
Unavailable	23,565	38,257	50,146	42,757

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Table 6. Summary of Reference Services

	FY 1971	FY 1972	FY 1973	FY 1974
Requests by telephone	10,027	11,505	11,803	13,316
Government	4,653	4,922	4,507	5,397
Nongovernment	5,374	6,583	7,296	7,919
Requests by mail	1,391	1,570	1,229	1,398
Government	133	104	63	200
Nongovernment	1,258	1,466	1,166	1,198
Readers assisted	8,868	9,347	11,107	12,594
Government	3,219	3,393	3,207	4,307
Nongovernment	5,649	5,954	7,900	8,287
Total	20,286	22,422	24,139	27,308
Government	8,005	8,419	7,777	9,904
Nongovernment	12,281	14,003	16,362	17,404
Reading room users registered	22,382	20,350	16,938	15,209

Technical Services

During the fiscal year 1974, CATLINE (Catalog On-Line) and SERLINE (Serials On-Line) became operational systems; both systems were developed during FY 1973. In addition, an on-line Inprocess (INPROC) File and on-line Invoice File were designed and implemented during 1974.

NLM's CATLINE contains full bibliographic data for approximately 140,000 citations; it is updated biweekly and is accessible through NLM's MEDLINE user network, as is SERLINE. Machine readable cataloging has as a result become available to MEDLINE users, providing support for a number of library activities such as acquisitions, cataloging, reference, and interlibrary loan.

SERLINE provides direct and immediate access to bibliographic and location data for some 6,000 substantive serial titles held by 117 resource libraries in the Regional Medical Library Network. It has great potential as a tool for implementing and maintaining cooperative collection assignments. SERLINE's bibliographic and location data are continuously monitored, updated, and refined by the Library.

The on-line Inprocess File, developed and implemented during FY 1974, reflects the current status of every item ordered, received, and in the process of being cataloged by NLM or by a cooperative cataloging partner; it is the control point for all bibliographic records until cataloging is completed. INPROC contains approximately 10,000 records. An on-line invoice file which controls, monitors, and regulates the flow of invoices also produces regular management reports on the status of items in the file. This system provides for on-line input of data into the file, capability for searching any invoice or vendor in the file, and production of up-to-date reports on the status of funds expended from the Division's literature budget.

Contractors were engaged for the following tasks in FY 1974:

- The preparation of approximately 15,000 volumes for shipment to the bindery.
- The cataloging of some 2,425 SERLINE titles for input into the CATLINE data base, and the recataloging of 377 additional journal titles to conform to the Anglo American Rules before input into CATLINE.
- Assistance in building the SERLINE data base by adding publishers names, title holdings, ISSN's, and locator codes for the 117 medical libraries in the Regional Medical Library Network which participate in SERLINE.

Table 7. Growth of Collections, FY 1974

	Volumes Added	Total Volumes in Collections
Book Material		
Bound Monographs		
Prior to 1800	473	39,710
1801-1913	637	90,587
1914-present	11,937	269,896
Bound issues	20,617	439,029
Unbound issues (volumes)	2,108	48,056
Theses	325	340,585
Pamphlets	61	171,989
Total book material	36,158	1,399,852
Nonbook Material		
Microfilms (archival)	4,226	17,520
Microfiche	1,261	6,648
Pictures	565	70,003
Total nonbook material	6,052	94,171
Total book and nonbook material	42,210	1,494,023

Table 8. Summary of Acquisition Statistics

	FY 1972	FY 1973	FY 1974
Serial Record			
New titles added	1,172	741	960
Discontinued titles	201	86	105
Current titles received	23,132	23,787	24,642
Publications Processed			
Serial pieces	87,995	100,930	93,371
Other	20,323	20,548	16,148
Total	108,318	121,478	109,519
Obligations for Publications	$430,000	$575,000	$689,740
Included for rare books	79,583	118,133	101,769

Table 9. Summary of Cataloging Activities

	FY 1972	FY 1973	FY 1974
Completed cataloging	13,595	13,161	11,382
Catalog cards filed	105,236	112,716	134,190
Volumes shelf-listed	8,549	9,494	9,900

Table 10. Binding Statistics

	FY 1972	FY 1973	FY 1974
Number of Volumes			
Send to binder	20,619	32,362	31,900
Obligations for binding	$64,852	$114,787	$110,595

Specialized Information Services

The Library's Specialized Information Services administers the Toxicology Information Program(TIP)established in 1967 in response to recommendations by a President's Science Advisory Committee Panel. The Program's mission is: (1) to set up computer-based data banks of toxicology information derived from the scientific literature and from the files of collaborating governmental and nongovernmental organizations; and (2) to provide toxicology information and data services to the scientific community. The Program provides services in three modes: query response, publications, and on-line interactive information retrieval systems. The last is dealt with in the chapter On-Line Retrieval Services.

Query Response

During 1974, TIP continued to support the Toxicology Information Response Center (TIRC) at the Oak Ridge National Laboratory. During this period, some 350 comprehensive literature searches were carried out by TIRC in response to requests from scientists and organizations. These searches covered all segments of toxicology and resulted in bibliographies which were sent to the requesters. Bibliographies may include computer printouts derived from TOXLINE or MEDLINE searches as well as citations and abstracts that are obtained through manual searches of the conventional secondary literature sources.

The use of the $50 per search unit charge was continued to help defray portions of the total cost of this service. The National Technical Information Service handled the billing and collection functions for TIRC. In addition, some 20 bibliographies completed by TIRC were published for sale through that agency. Steps were taken to establish formal interagency agreements with other Federal organizations for literature search services from TIRC on a full direct cost recovery basis (i.e. $20/hour). For example, such an interagency agreement was set up between NLM and the National Center for Toxicological Research of the Food and Drug Administration.

Publications

The Toxicology Information Program continued to support the preparation and publication by Biological Abstracts of the secondary journal, *Abstracts on Health Effects of Environmental Pollutants*. Twelve monthly publications were issued, each containing citations and abstracts for approximately a thousand items. An *Annual Cumulative Index* for Volume 2 (1973) was prepared and published. Publication of the *Toxicity Bibliography*, a quarterly secondary journal containing citations and MeSH terms for articles in the field of toxicology, extracted from the MEDLARS data base, was continued for the sixth year.

During the year, the following state-of-the-art reviews, sponsored by the Toxicology Information Program through the Toxicology Information Response Center, were published in selected scientific journals:

Health Hazards from Chemical Impurities: Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans by J. E. Huff and J. S. Wassom

Effects of Exposure to Microwaves—Problems and Perspectives by S. M. Michaelson

Products Marketed to Promote Growth in Food-Producing Animals: Steroid and Hormone Products by E. J. Umberger

Asbestos: World Concern, Involvement and Laissez-Faire by A. S. Hammons and J. E. Huff

Mycotoxins: Toxicity, Carcinogenicity and the Influence of Various Nutritional Conditions by P. M. Newberne

DHEW Toxicology Committee

Early in the fiscal year, the HEW Assistant Secretary for Health established a new Committee to Coordinate Toxicology and Related Programs throughout the Department. In January 1974, a Toxicology Information Subcommittee was created. NLM's Toxicology Information Program was given the responsibility for coordinating the activities of the Subcommittee and for implementing the information and data projects that the Subcommittee will sponsor. As a result of its first meeting in February 1974, the Subcommittee has identified a number of projects for implementation when resources become available:

1. *A DHEW Toxicology Information System*—an on-line interactive retrieval file on government supported research-in-progress in toxicology and related fields. The information would be extracted from the project report files of the Smithsonian Science Information Exchange.

2. *Base Line Response in Laboratory Animals Data Bank*—The first step in this project—a feasibility study—is now in progress.

3. *Roster of Toxicologists*—an on-line retrieval file and probably a printed directory of scientists active in toxicology and related areas.

4. *Chemical File Support Services*—NLM's capability of processing files through the CAS Name-Match system to obtain CAS Registry Numbers (see On-Line Retrieval Services) would be made available to DHEW agencies via the Subcommittee.

5. *Literature Support Services*—Literature search services, special bibliographies, and state-of-the-art activities would be provided by the Toxicology Information Response Center to DHEW agencies and the Subcommittee.

III. ON-LINE RETRIEVAL SERVICES

This past year there was an emphasis on activity designed to smooth the changeover from MEDLARS I to MEDLARS II so that there would be a minimum of disruption of NLM's network user community. During the spring of 1974, a series of regional orientation workshops was conducted by senior NLM staff to introduce the new capabilities and search techniques to staff of the 235 MEDLINE Centers throughout the nation. The monthly NETWORK-MEDLARS/*Technical Bulletin* and the publication of new manuals and other materials have helped to keep NLM's network users informed of changes in the system and to prepare the users for the greater capabilities and versatility of NLM's new on-line services.

The number of MEDLINE Centers increased from 178 to 235 in FY 1974. This expansion of the network was primarily through hospital libraries which formed MEDLINE consortia, thus stimulating not only the sharing of on-line information retrieval services, but stimulating cooperation in other areas of library services as well.

MEDLINE service is provided through a data communications network which allows access through a local dataphone call in any of 50 major metropolitan areas across the nation. The communications network also has a node in Paris and is being used regularly by the Institut National de la Santé et de la Recherche Medicale, the British Library System in London, the World Health Organization in Geneva, and by fifteen Canadian Centers. Additionally, the MEDLINE service is operated from a computer in Sweden and is accessed by remote terminals in eight locations in Sweden and one each in Denmark, Finland, Norway, The Netherlands, and Poland, thereby greatly extending its availability. In the past, MEDLINE service has been provided free of charge to using institutions. The widespread acceptance of MEDLINE and projections of its continued rapid growth strongly indicated a need to establish some form of user charges for the two-fold purpose of establishing a degree of management control over the growth of the system and to provide a suitable funding alternative. A charging policy was begun on August 20, 1973. The user cost is $6 per connect hour, plus 10¢ per page for off-line prints. The minimum charge for a user institution is $12 per month.

In preparation for the MEDLARS II system, the MEDLINE file of journal article references was converted in the spring of 1974 to include all MEDLARS citations for the two-year period beginning January 1972 plus the current year. Thus, MEDLINE now provides access to articles in over 2,200 journals. Previously, MEDLINE contained references to about 1,000 journals for three years plus the current year. The new MEDLINE file contains about the same number of citations—some 500,000.

In addition to MEDLINE, the on-line data bases available at the end of the year included:

SDILINE (Selective Dissemination of Information On-Line)—a complete file of the next month's *Index Medicus* citations available for test searching and current awareness services. References contained in SDILINE are almost one month ahead of the *Index Medicus* publication date.

CATLINE (Catalog On-Line)—a data base containing full bibliographic data for all materials cataloged at NLM and appearing in the *NLM Current Catalog* since 1965. It contains approximately 130,000 references and is updated twice a month. CATLINE is used to support a number of library activities ranging from acquisitions and cataloging to reference and interlibrary loan.

SERLINE (Serials On-Line)—provides on-line access to the bibliographic data for some 6,000 serial titles as well as identifying the libraries holding a given title. SERLINE is used primarily for interlibrary loan activity within the Regional Medical Library Network.

MEDFILE (MEDLINE File)—contains citations from approximately 1200 journal titles indexed in *Index Medicus* from 1970 through 1973. This file is available only on a limited time schedule (rather than daily as with MEDLINE). Although searches may be performed on-line, the user must await the arrival of his search in the form of an off-line print-out by mail.

COMPFILE (Complement File)—contains the citations to journal articles indexed from 1970

through 1973 in *Index Medicus* but not included in MEDFILE. Like MEDFILE, COMPFILE is available only on a limited time schedule and the user must await the arrival of an off-line printout by mail. Using MEDFILE, COMPFILE, and MEDLINE it is possible to search the entire *Index Medicus* data base from 1970 to the present.

MEDFILE and COMPFILE are interim data bases that will eventually be merged into a BACKFILE.

Table 11. Summary of FY 1974 On-Line Searches

	FY 1973	FY 1974
Searches		
MEDLINE	141,730	178,983
SDILINE	13,363	27,646
CATLINE	1,601	45,771
SERLINE	477	2,880
BACKFILE*	1,651	10,138
TOXLINE**	6,000	13,000
Total	164,822	278,418
Off-Line Prints		
MEDLINE	40,115	40,924
SDILINE	5,865	13,866
BACKFILE	1,611	11,143
CATLINE	9	382
SERLINE	—	134
TOXLINE***	—	1,034
Total	47,600	67,483

*BACKFILE includes COMPFILE and MEDFILE
**Estimated; includes CHEMLINE
***Since transition to NLM computer in April 1974.

TOXLINE

During this year, the Toxicology Information Program (TIP) continued to improve and expand the on-line toxicology bibliographic retrieval service, TOXLINE. The service provides the subscriber with remote on-line access to a data base consisting of over 320,000 bibliographic records, enriched with index terms or full abstracts, from the scientific literature. They deal primarily with the toxicology/pharmacology of drugs, pesticides, industrial chemicals, environmental pollutants, and hazardous household chemicals. On-line retrieval from TOXLINE is based on free-text searching; most words in titles, index fields, and abstracts can be searched for, singly or in combination.

The user community for TOXLINE grew to over 105 organizations by the end of June 1974: 28 academic, 52 industrial/commercial, 19 government, and 6 miscellaneous. The system usage reached a level of 350/hours per month. Approximately 13,000 searches were completed by TOXLINE users during this year.

For reasons of greater operating efficiency, the decision was made to move TOXLINE from a contractor operated computer to NLM for parallel operations with the MEDLINE services. In this situation, TOXLINE is using the MEDLINE software, ELHILL. The rather cumbersome task of transforming the entire 300-million character TOXLINE file to the ELHILL software system was accomplished on schedule and, since April 1974, the system has been operating effectively from NLM. As a result of this transfer, it was possible to lower user costs from $45 to $15 per terminal hour. Also, TOXLINE users had to be taught to use the ELHILL query language. To this end, a series of short training classes were held for TOXLINE users and an interim User Training Manual was prepared for these users. A more permanent TOXLINE training and reference manual is now being prepared for all TOXLINE users. As new users are coming into the system, they are given three-day training courses taught

by NLM staff. The TOXLINE *Technical Bulletin* (formerly TOXLINE *Newsletter)* became the official organ for transmitting technical information about TOXLINE to its users. A TOXLINE Technical Management Group was created with in-house staff to handle technical problems being experienced by TOXLINE users. TOXLINE now contains the following bibliographic files:

1. *Toxicity Bibliography*—a MEDLARS subset, 86,967 citations with MeSH terms, 1968-March 1974.
2. *Chemical Biological Activities*—A Chemical Abstracts Service (CAS) publication and tape service with 169,383 abstracts and CAS Registry Numbers to identify compounds, 1965-March 1974.
3. *Abstracts on Health Effects of Environmental Pollutants*—a BIOSIS publication supported by NLM, with 24,428 indexed citations or abstracts and CAS Registry Numbers, 1972-Dec. 1973.
4. *Pesticide Abstracts* (formerly *Health Aspects of Pesticide Abstracts Bulletin)*—an Environmental Protection Agency publication, with 13,062 abstracts and CAS Registry Numbers, 1966-Dec. 1973.
5. *International Pharmaceutical Abstracts* (IPA)—a publication and tape service of the American Society of Hospital Pharmacists with 20,574 abstracts, 1970 - March 1974.
6. *Hayes File*—a collection of 10,043 citations for articles on the health effects of pesticides, 1950-1966 (a precursor to *Pesticide Abstracts).*

CHEMLINE

Since January 1974, TOXLINE users had an auxiliary, on-line retrieval system for chemical nomenclature information called the TOXLINE Chemical Dictionary. In April 1974, NLM changed the name of this file to CHEMLINE, and made it available in ELHILL. CHEMLINE takes its contents primarily from the Registry Files of the Chemical Abstracts Service (CAS). Through the active cooperation of both CAS and the Computer Sciences Division, Oak Ridge National Laboratory, TIP was able to access the massive CAS Registry Nomenclature tape files—covering some 2.6 million unique compounds and over 3.5 million names—and extract from them all records for compounds that are cited by CAS Registry Numbers in TOXLINE . This resulted in a file of 60,000 CAS Registry Number records containing CAS Registry Numbers, molecular formulae, and all names known to the CAS system. Where available, certain other compound identifiers, such as Wiswesser Line Notations, are being added to the file. The results of a CHEMLINE search normally are used in combination with other search terms for a more precise and complete search in TOXLINE. CHEMLINE is available to all TOXLINE users at $15/hour.

Toxicology Data Retrieval

The success of on-line bibliographic retrieval systems suggests that the same technology could be applied effectively to data retrieval. Plans were therefore made to adapt or build several data banks in toxicology for retrieval in the same software system (ELHILL). One of the on-line, interactive data retrieval files which TIP is constructing is the Product Composition File which will contain up-to-date information on manufacturers, usage, formulations, Chemical Abstracts Service Registry Numbers, components, and toxicological properties of some 10,000 commercial products sold in the United States.

Another on-line interactive data retrieval file which TIP is constructing is the Toxicology Data Bank. This file will contain *evaluated* data as found in a selected set of sources, such as textbooks, criteria documents, reviews, or the files of specialized information centers, on compounds known to be hazardous and to which populations are exposed.

CAS Registry Numbers

As previously mentioned, TIP is intimately involved in the construction of toxicology information and data bases in which the identification of chemical substances is of great importance. After careful evaluation of existing systems, the decision was made to adopt the Chemical Abstract Service Registry Numbers as the unique identifiers of chemical substances in these files. In order to facilitate this operation, TIP, in collaboration with CAS and the Computer Sciences Division, Oak Ridge National Laboratory (ORNL), modified and installed the CAS Name-Match system at ORNL.

The function of the CAS Name-Match system is to compare a chemical name with the CAS

Registry Nomenclature File. If a match is made, the system will output the CAS Registry Number, molecular formula, and Chemical Abstracts Index nomenclature (as well as other names and synonyms known to the CAS Registry System) for the input name. Under contractual arrangement with CAS, TIP acquired the CAS Name-Match system and the corresponding Registry Files of CAS. Certain design modifications by TIP and ORNL staffs resulted in a free-standing (i.e., independent of other modules of the CAS Registry System) Name-Match system. TIP now has permission to use the CAS Registry Nomenclature Files to update CHEMLINE and to perform Name-Match activities for NLM and certain other government agencies.

Collaborative Activities

During FY 1974 the National Library of Medicine and the National Cancer Institute have agreed to place cancer-related abstracts into data bases residing in the NLM system and using the NLM telecommunications network to make the data available to cancer research institutions. Under this arrangement the Cancer Chemotherapy Abstracts data base involving 13,000 abstracts is now available. During FY 1975, 18,700 abstracts previously published in Carcinogenesis Abstracts and 6,000 reports of ongoing cancer research will be added to the NLM data base.

The Library continues its contractual arrangements with the State University of New York at Albany to provide a MEDLINE backup to the existing system. This is especially important in light of the significant increases in user demands, and as an alternative in the event of system failure at NLM.

MEDLARS II

During FY 1974, the MEDLARS II development project neared completion. At the close of the fiscal year, the system had been used successfully to build a seven-level vocabulary file, a journal file, and the current citation file. MEDLINE was installed under ELHILL III—the MEDLARS II retrieval program—during June 1974. The entire MEDLARS II system is working satisfactorily for journal citation processing, including input, file generation, retrieval, and publication processing.

Final delivery of all MEDLARS II software modules and documentation is anticipated by the end of August 1974 and acceptance by NLM completed by the end of September 1974. At that time MEDLARS II should be fully operational, allowing the removal of the Honeywell 800 system shortly thereafter.

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IV. GRANTS FOR LIBRARY ASSISTANCE

Medical Library Assistance Act

The 93rd Congress extended the Medical Library Assistance Act* for two years, through 1976, with a provision that there would be an automatic third year extension (FY 1977) if Congress does not act to modify the legislation. There are several revisions to the Medical Library Assistance Act. The new act consolidates all program authorities except construction, which was repealed. Appropriations of up to $17.5 million for fiscal year 1975 and $20 million for fiscal year 1976 have been authorized. This lump sum appropriation creates more flexibility in the use of funds as program priorities change.

Administration

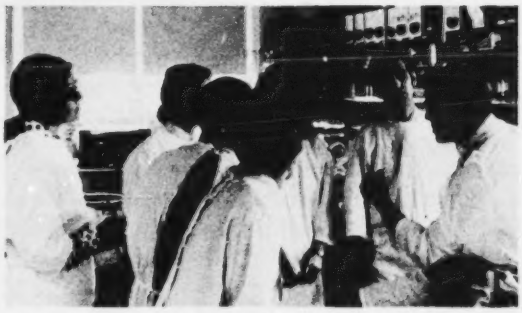
The Office of Extramural Programs of the National Library of Medicine is responsible for the administration of the Medical Library Assistance Act as extended, as well as the Library's Special Foreign Currency Program sponsored under Public Law 480, which provides financial support for a wide variety of foreign publication projects.

The Division of Biomedical Information Support is concerned only with the programs authorized by the Medical Library Assistance Act. The International Programs Division administers a publications program sponsored under Public Law 480, as well as a publications program authorized by the Medical Library Assistance Act.

Division of Biomedical Information Support

Five funding mechanisms are available to the Division of Biomedical Information Support, all of which aid the Division in promoting the programmatic interests of the National Library of Medicine.

Training grants for medical librarians and health information personnel have been unusually productive in this respect. Although the Library was unable to accept applications for new training grants in FY 1974, the support of seventeen training grants and one fellowship was continued under the terms of the phaseout requirements.



In a program funded by NLM grant, medical librarians (such as the one at the left of the picture) accompany teaching physicians and medical students on rounds in hospitals linked with the University of Connecticut Health Center. The librarians later supply reading material related to what they have seen and heard on rounds.

Research grants are available to investigators in the broad area of biomedical communications for the testing of hypotheses, the systematic development of the tested concept, and the opportunity to demonstrate the activity to other interested parties.

Special Scientific Project awards are available to mature scientists so they may devote their full attention to the preparation of a monograph or treatise on a broad health topic. In addition to the state of the art in the particular area of the author's competence, the manuscript would include future projections based on the author's knowledge of the topic as well as the social, political, and economic ramifications of the subject. The resultant book would be of interest not only to the author's scientific peers and colleagues but also to health planners, politicians, sociologists, and economists who are concerned with health problems and health care delivery.

Contracts are used as the mechanism of support for the day-to-day operation of the Regional Medical Library network.

Resource grants support projects directly or indirectly related to the development of the RML

*These MLAA provisions were signed into law July 23, 1974, as Public Law 93–353, Title II.

network. The scope of a project may be limited to the primary constituency of the library or could involve an outreach to the larger community. A grant to a local library makes that library a more active and effective participant in that region. Many of the grants, while given to an individual library, involve activities and services extending beyond its immediate constituency. This subregional activity has progressively increased over the years until, in FY 1974, three-fourths of a million dollars was awarded to libraries for these purposes.

These five types of awards collectively support four program areas that are identified as major objectives of the National Library of Medicine.

1. Medical Libraries and Librarianship
   Several groups of investigators, with NLM support, have been testing, developing, and demonstrating the use of the computer in automating various library activities, such as serials control, circulation, acquisitions, and other data processing activities. In another project, which interfaces a medical school library with a state-wide area health education center program, resource materials and other assistance are provided by the grantee to various community hospitals. Another grant is assessing the needs for the continuing education of medical librarians and developing an integrated plan to meet these needs.
   The above examples are of projects studying various facets of libraries and librarianship. In addition to these, 50 improvement grants were awarded in FY 1974. These grants, averaging less than $3,000 each, are given to small hospital libraries to improve their basic holdings. While these grants are of primary importance to the local hospital, they impact directly on the Regional Medical Library network. The local hospitals are able to have available the most commonly utilized books and journals, thus obviating interlibrary loans of these materials.
2. Biomedical Information Science and Services
   Examples in this category include nomenclature projects sponsored by professional societies to formulate standard terminology and classification for their subject areas. Another project is concerned with the development of an automated program to select, from a large data base, information related to a specific disease. These subsets may be obtained by utilizing clinical signs as index and search terms. This system is oriented to the clinician user, a new approach.
   Over one million dollars was expended in FY 1974 in the support of biomedical information science and services. This amount is a five-fold increase over the level of support in this area four years ago and is indicative of the priority the Library places on biomedical communications.
3. Education and Knowledge Transfer
   One project in this area supports the testing and evaluation of instructional materials prior to publication. Student and faculty members evaluate the material in draft form and provide feedback information to the author who then incorporates this into the final manuscript. This procedure ensures a much improved final edition of workbooks, self-instructional and self-testing books, atlases, and other materials. Other grants have been made to medical libraries to provide reference services to community hospitals within a local area, state, or region.
4. History of Medicine
   Two projects in the history of medicine will illustrate the nature of this support program. The first concerns Transylvania University in Lexington, Kentucky, the first medical school in the United States west of the Appalachian mountains. In operation from 1800 to 1859, the Transylvania library contains a unique collection of well-preserved early 19th century medical texts. Under the grant, a catalog of this collection will be published, making this valuable historical resource more widely known among medical historians.
   The second project is centered at the Pennsylvania Hospital in Philadelphia, the oldest public hospital in the United States. Founded in 1751, its library has

served practitioners since that time and contains unique archival materials of major importance. This material is being inventoried and a catalog will be published to coincide with the U.S. bicentennial celebration.

International Programs Division

The publications support programs administered by the International Programs Division facilitate the dissemination of scientific information important to medical progress and the public health. Carried out both within the United States, through the Publication Grant Program, and abroad (PL 480 program) with special U.S.-owned foreign currencies in Poland, Israel, Tunisia, Yugoslavia, India, and Pakistan, these selective programs continue to produce studies useful to U.S. scientists, educators, and health practitioners. The PL 480 program is described in the chapter on International Activities.

The domestic Publication Grant Program provides support for biomedical publications of a nonprofit nature, including critical reviews and monographs in health fields; secondary literature tools (bibliographies, atlases, guides, etc.); publications in library science, biomedical communication, and information science; temporary support for serial publications to develop innovative approaches to periodical information packaging; research and translations in the history of medicine; the translation and publication of foreign biomedical monographs; and the publication of the proceedings of international symposia and conferences related to U.S. health needs.

A total of 32 Publication Grants was funded during FY 1974, 15 of which were new awards. Among the new awards were a project for the preparation and publication of a comprehensive atlas on the pathology of tropical diseases and a critical review on advances made in the training of allied health personnel.

During FY 1974, 23 books, periodicals, and journal articles were published with support from publication grant awards in prior years. These are listed in Appendix 3.

Table 12. Resource Project Grant Allocation by Network Level*

Network Levels	1971	1972	1973	1974
Local	$343,514	$1,239,595	$1,587,919	$1,443,442
Subregional	242,985	363,222	617,206	747,999
Regional	270,559	218,312	220,035	297,888
Total	$857,058	$1,821,129	$2,425,160	$2,489,329

*Includes support for Regional Medical Libraries

Table 13. Resource Project Grant Allocation by Objective*

Objectives	1971	1972	1973	1974
Medical libraries and librarianship	$549,108	$1,608,036	$1,641,234	$1,066,082
Biomedical information services	53,867	245,202	351,286	712,400
Education and knowledge transfer	402,505	441,407	579,624	773,529
History of medicine	18,404	64,268	61,942	105,250
Total	$1,023,884	$2,358,913	$2,634,086	$2,657,261

*Includes support for Regional Medical Libraries

Table 14. Summary of NLM Extramural Programs

Program	New Awards FY 1974	Active Grants & Contracts June 30, 1974	Projects Completed FY 1974
Research	5	27	5
Resource	85	156	139
Training & Fellowships	2	18	1
Special Scientific Projects	1	3	1
Publication	17	29	12
Special Foreign Currency*	31	70	34
Regional Medical Library	—	10	—
Total	141	313	192

*See International Activities

V. AUDIOVISUAL PROGRAMS

"A most beautiful demonstration of partnership" was the way one Regent at the March 1974 Board of Regents meeting described the ongoing successful cooperative program between the Library's National Medical Audiovisual Center (NMAC) and national professional societies to evaluate audiovisual instructional materials in biomedicine. Other significant progress during FY 1974 included the beginning of an evaluation project to assess NMAC's film and videotape distribution system, increasing the number of self-instructional units available through the U.S. Government Film Sales Program, final production of films and study manuals of 15 modules on restorative dentistry, and design for a multimedia Learning Resource Center to be constructed at NMAC in Atlanta.

Clearinghouse

In the effort to develop an automated data base of information on nonprint instructional materials relevant to professional education in medicine, dentistry, and allied health sciences, approximately 22,000 citations to instructional materials have been entered into an in-house working file to provide raw data on audiovisuals available for peer review and evaluation. Action was taken to obtain professionally written abstracts and acquire catalog information on approximately 2,800 audiovisuals to be entered into the clearinghouse data base; these entries will ultimately be retrievable via an on-line computer system.

Evaluation and Acquisition

Evaluation procedures and criteria for assessing items to be entered in the clearinghouse were standardized in FY 1974. Through the contractual agreement between the National Library of Medicine, the Association of American Medical Colleges, and the American Association of Dental Schools, about 150 items in a variety of mediated formats are scheduled for peer review every three weeks. NMAC acquires the instructional materials on loan and prepares them for the peer-review process. Specialists in education, audiovisual production, and content then screen and evaluate the materials for design, quality, and content adequacy. The results of the review are tabulated and recommendations made for input of the items into the clearinghouse. Items that receive acceptable ratings and are not nationally available are acquired by NMAC for distribution. During FY 1974, 110 new titles were acquired.

A major evaluation project to assess the film and videotape distribution system of NMAC was begun under a contract with ABT Associates, Cambridge, Massachusetts. Preliminary results obtained from a questionnaire survey of users of the system indicated that:

1. Both the film distribution and videotape duplication programs are used primarily for teaching purposes by a heterogeneous population of biomedical educators.
2. Audiovisuals ordered from NMAC receive heavy exposure and serve as a valuable resource for the needs of biomedical educators.
3. Clients of NMAC are well satisfied with the service they receive.
4. Audience interest and enhancement of the educational process are perceived by NMAC audiovisual users to be at high levels.
5. An analysis of the NMAC distribution operation indicated a very favorable benefit/cost ratio.

Distribution

Over 56,000 requests for film loans were filled during FY 1974. The development of the collection toward professionally oriented materials continued with the addition of 110 peer-reviewed titles and the withdrawal of 88 titles (2,450 prints) directed to lay audiences. As expected, statistics reflected a definite increase in the percentage of professional health science users as opposed to lay users.

Over 3,300 videotape programs were duplicated from the Center's collection of

master instructional videotapes, and furnished to schools requesting them.

There were 21 new self-instructional teaching packages added to the collection presently available for sale through the U.S. Government Film Sales Program. The titles are:

Single Concept Units:	Closed Chest Tube Thoracotomy
	Left Ventricle Catheterization
Gross Anatomy Series:	The Femoral Triangle
	The Scapular Region
	Posterior Compartment of the Forearm
Nuclear Medicine Series:	Liver Scanning
	Focused Collimators
Pediatric Ambulatory Series:	Acute Asthmatic Attack
	Febrile Convulsions
Introduction to Congenital Heart Disease Series:	Part 3—Common Acyanotic Lesions
	Part 4—Common Cyanotic Lesions
	Part 5—The Large Ventricular Septal Defect in Infancy
Mammography Series:	Introduction to Mammography
	Mammography Technique
	Breast Diseases: Their Importance in Your Daily Practice
Basic Pathology Series:	Immune Complexes and Disease
	Disorders of the Stomach and Duodenum
	Flail Chest with Hemopneumothorax

Workshops and Conferences

A total of 815 participants from the biomedical community attended 20 workshop sessions conducted by NMAC staff and visiting faculty in Atlanta and nine field locations. Titles of these workshops were:
Management of Learning Resources, Design of Instructional Media, Television in the Medical Environment, Evaluation of Instructional Materials in Medical Education, Graphics in Health Sciences Education, Learning Spaces, Symposium on Instructional Technology, Anatomy Workshop, and Workshop for Nurse Physiologists.

The Center was host to the Fourth Annual Conference of Directors of Biomedical Communication on January 28-29, 1974. The Conference was attended by 59 directors and 15 observers from health science schools and related organizations. The decision was made to organize the group formally, and a bylaw committee was elected with Dr. Horace Hartsell, University of Texas Medical Center, Dental Branch at Houston, as Chairman.

Advisory Services

NMAC staff conducted surveys or site visits at the following institutions: seven community colleges on the islands of Hawaii, Kaui, Maui, and Oahu; University of Arkansas Medical Center, Little Rock; University of New Mexico, School of Medicine, Albuquerque; Downstate Medical Center, SUNY, Brooklyn; Long Island-Jewish Hillside Medical Center, New Hyde Park; New Children's Hospital of Philadelphia; University of Alabama, College of Community Health Sciences, Tuscaloosa; University of Utah Medical Center, Salt Lake City; University of Maryland School of Nursing, Baltimore; Meharry Medical College, Nashville (2 visits); Johns Hopkins School of Medicine, Baltimore; State University of New York, Buffalo (2 visits); University of Miami Medical School; University of Alabama, Birmingham; Saint Louis University, School of Medicine.

Facilities planning assistance was provided to 20 institutions including schools of medicine, dentistry, osteopathy, podiatry, nursing, and allied health. In-house consultations on specific problems in the area of facilities planning were provided to 101 institutions during the year.

Post-survey assessments were conducted at Mayo Medical School and Clinic, University of Oklahoma Health Science Center, and Stanford University Medical Center. A review of the assessment profiles indicates that NMAC efforts to stimulate and improve biomedical communication programs in these institutions have been highly effective. Mayo adopted all

recommendations in the initial survey report with the following results: all media operations have been centralized under a director; major production and service capabilities have been developed, including a Learning Center with a full-time librarian; several classrooms were modified for multimedia presentations.

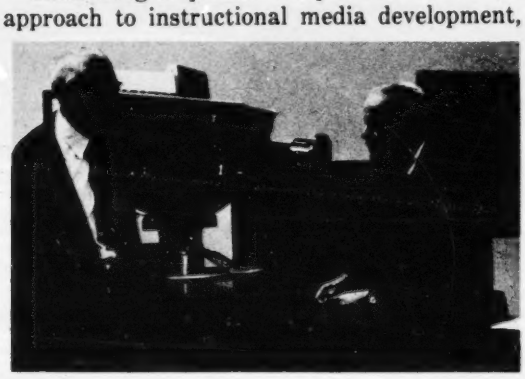
Direct problem-oriented consultation services relating to educational technology and instructional media development were provided on 88 occasions for 170 representatives of 21 schools of medicine, seven schools of dentistry, three schools of nursing, eight schools of allied health, five national or international organizations, and 28 teaching hospitals and other health science institutions.

Designs are nearing completion for a multimedia Learning Resource Center to be constructed at the Clifton Road (Atlanta) facility for demonstration purposes, and for use by visiting faculty and medical librarians. It will also serve as a proving ground where NMAC staff can test new ideas in learning space configuration and in audiovisual media management. Furniture and equipment are on order, and the new unit is scheduled to begin operation in FY 1975.

Media Development

During FY 1974 the Center completed four motion pictures, 15 television productions, and nine slide/tape sets.

Continuing emphasis was placed on the team approach to instructional media development, with each team consisting of a subject matter specialist, an education specialist, and an audiovisual specialist. The method is being used for in-house productions and taught in workshops for health science faculty. Information on this procedure is contained in "A Team Approach to Developing an Audiovisual Single Concept Unit," by M. L. Brooke, R. W. Bell, and M. J. Oppenheimer, published in the *Physiology Teacher*, Vol. 3, No. 3, 1974.



Dr. Shields Warren, noted pathologist, and Dr. John Bowers, President of Alpha Omega Alpha, prepare for a videotaping session at NMAC.

Modifications based on field tests and final production of films and study manuals are nearing completion for Project ACORDE (A Consortium on Restorative Dentistry Education). Pilot versions of these units have been validated with students and approved by 53 dental schools. The materials will be made available through the U.S. Government Film Sales Program.

Three additional modules are nearing completion in the film series on Family Oriented Maternity Care by the Nurse Clinician, developed with the School of Nursing, Emory University: "Labor," "Delivery," and "The Neonate." Another series being developed cooperatively with the same school is titled "Behaviorally Speaking." Each module in the series of eight will consist of a film and a study manual.

Major accomplishments in television for FY 1974 include the completion of 10 additional videotapes in the "Leaders in American Medicine" series, produced in cooperation with the medical honor society Alpha Omega Alpha. NMAC is also supplying television support to the experimental satellite ATS-6 in cooperation with the Veterans Administration Division of Medicine and Surgery, Learning Resources Office of Academic Affairs. Working with FACT (Foundation for the Advancement of Communications Technology) the Center is furnishing a variety of production services in the preparation of videotapes for transmission to health science professions.

The recent acquisition of sophisticated equipment including color cameras, switching devices, and time-base correctors will significantly augment NMAC's television capability.

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Publications

The publications program begun last year continued during FY 1974. Monographs No. 3, No. 4, and No. 5 were published: *Organizing a Biological Photographic Unit, Financing a Biomedical Communication Program,* and *A Medical Television Center.* Monograph No. 6, *Operating a Learning Resource Center,* is in printing. Two case studies were also published: *Cooperative Sharing of Audiovisual Materials,* and *Establishing a Learning Resource Center in a Medical Library.*

Audiovisual Productions—FY 1974

Motion Pictures

The Autonomic Nervous System—An Overview

What's New in Medical Education

Clinical Evaluation of the Hip

Initial Assessment and Management of Burns

Slide Series

Hepatic Excretory Function: Jaundice

How to Design an Effective Measuring Instrument

Congenital Heart Disease
- Part III: Common Acyanotic Lesions
- Part IV: Common Cyanotic Lesions
- Part V: The Large Ventricular Septal Defect in Infancy

Team Dentistry

Perinatal Assessment of Maturation

Febrile Seizures

Hypoglycemia of the Newborn (revision)

Television Projects

Leaders in American Medicine (series)
- Dr. Howard C. Taylor
- Dr. Maxwell M. Wintrobe
- Dr. George W. Corner
- Dr. John Enders, Dr. Frederick Robbins
- Dr. Karl Meyer
- Dr. Grace A. Goldsmith
- Dr. George L. Engel
- Dr. Cecil Watson
- Dr. Emil Holman
- Dr. Helen Taussig

Cardiac Physical Assessment

Closed Chest Tube Thoracotomy—Tracheostomy and Thoracentesis

Autopsy Dissection Techniques

Adult Physical Assessment

Pediatric Physical Assessment

Filmstrips

Accidentes Del Transito

Dengue Fever

Dengue

La Historia Clinica

La Jeringuilla Hipodermica

La Pipeta

VI. HEALTH COMMUNICATIONS RESEARCH

NLM's research and development component, the Lister Hill National Center for Biomedical Communication, manages a number of projects to apply modern technology to the problems of biomedical information transfer. Because of a lack of in-house technical facilities, the principal implementation method is the research contract. The Lister Hill Center uses its funds to develop, test, and evaluate prototype networks rather than operate such networks. At such times as they show promise of becoming self-sustaining, or have provided all necessary data, the Center withdraws support to free funds for new projects. The Lister Hill Center is engaged in the following projects:

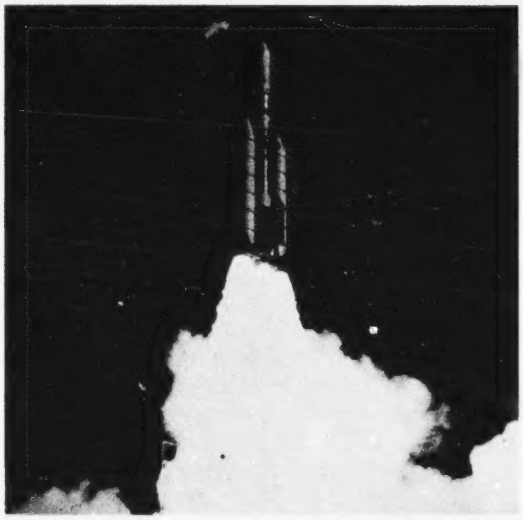
Application Technology Satellite-6 (ATS-6)

On the 30th of May, 1974, the ATS-6 left its launching pad at Cape Canaveral, passed from the control of Kennedy Space Center to that of Houston, and headed towards its temporary parking place in synchronous equatorial orbit, 22,235 miles above the Galapagos Islands.

ATS-6 is the world's largest and most powerful communications satellite, weighing 3,080 pounds. It will beam messages down to "giant footprints" on Earth, about 1,000 miles long by 300 miles wide. Two high-powered transmitters will bounce signals off its 30-foot diameter antenna, sending a television signal accompanied by four voice channels to as many as 144 receivers on the ground. Because of the satellite's power, the ground antenna receivers are inexpensive, small, and made of fiberglass. The 144 receivers will be installed either directly, each servicing a single set in a hospital, clinic, school, or community facility, or they will be tied in with public broadcasting microwave or cable systems already operating in Alaska, the Rocky Mountain states, and Appalachia.

ATS-6 will be available for experiments by a number of Federal, state, and regional agencies until May 1975. Then it will be moved to an equatorial position above East Africa where it will be visible to the Indian subcontinent. From there it will transmit programs on occupational skills, increasing food production, family planning, health and hygiene, and teacher training to a network of some 5,000 low cost community receivers in Indian villages.

The Lister Hill National Center for Biomedical Communications has been



Earl Henderson, Chief of the Lister Hill Center's Communications Engineering Branch, watches liftoff of the ATS-6. The satellite was launched into orbit from Cape Canaveral on top of an Air Force Titan III-C rocket on May 30, 1974.

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designated as the focal point for coordinating the DHEW health experiments over the ATS-6. Support is also provided by the Health Resources Administration and the Health Services Administration. These experiments will determine whether health care in remote areas can be improved by (1) telemedicine, and (2) by health education to train physicians whose undergraduate experiences are gained in rural America.

The telemedicine experiments, which will continue the work begun in Alaska with ATS-1 (see *NLM Programs and Services: FY 1973*), will be conducted at five Alaska sites equipped to transmit and receive video, voice, physiological information, and record data. Medics and health aides at two village clinics will present patients to viewing physicians at the Public Health Service Hospital at Tanana. Consultation with specialists will be available by satellite from Fairbanks and from the Alaska Native Medical Center at Anchorage. Patient medical records will be retrieved via ATS-1 from the Indian Health Service's Health Information System computer in Tucson, Arizona.

The health education experiment, involving a consortium of the four WAMI states (Washington, Alaska, Montana and Idaho), is in two parts—basic sciences and clinical medicine. Instruction in the basic sciences will involve faculty at the University of Washington (which has the only medical school in the WAMI area) in Seattle and students and faculty at the University of Alaska in Fairbanks. There will be full two-way voice and video interaction for classes in basic sciences, administrative conferencing, counseling, and computer-aided instruction and evaluation of student performance. Lectures, demonstrations, and classroom experiments will originate from both sites.

The experimenters hope to show that learning via satellite is fully as effective as learning in a "normal" classroom environment. It will be important to learn if the new technology is acceptable to the remote students and to the faculty at both sites.

The part of the health education experiment dealing with clinical medicine will involve third- and fourth-year medical students studying under clinicians in Omak in central Washington. The students will present patients by video and voice transmissions to the medical faculty of the University of Washington in Seattle. In addition to student presentations, the clinicians at Omak will choose patients under their regular care who have problems on which they wish consultation.

These experiments in clinical medicine will train students in preparing case studies and will also permit a careful evaluation of the students' knowledge and ability in the actual care of patients seen in practice. Clinicians at Omak will receive a valuable experience in continuing medical education; the patients seen will benefit from the consultation with the specialists in Seattle.

Much of rural America suffers from a serious doctor shortage. There is evidence that young doctors often choose to practice where they have received their clinical training. A system which supports the development of first rate clinical training in rural settings could work to encourage new physicians to enter rural practice.

Interact

Reported in previous years' *NLM Programs and Services*, the New Hampshire/Vermont Medical Interactive Television Network ("Interact," as it's now called) consists of seven institutions in the two states linked together by a mountaintop microwave network. The hub of the network is the Dartmouth Medical Center in Hanover, New Hampshire. Three of the institutions on the network, all within a 20-mile line-of-sight radius of the tower on Mt. Ascutney in New Hampshire, are served by a special mobile unit that carries microwave transmitting and receiving equipment, and TV cameras and monitors.

With live two-way voice and video communication, the network has become a regular working tool for the medical and allied health personnel at the seven locations. Each week, air time is allotted to such programs as grand rounds, speech therapy, conferences in neurology and neurosurgery, psychiatric consultations, and courses for nurses. During January of 1974, for example, the stations were on the air for a total of 278 hours, with individual users totaling 2,078 viewer hours.

A management consulting firm was retained

during 1973 to evaluate the impact, cost-effectiveness, and potential for self-sufficiency of the network. Their report* shows that interactive television is an effective medium for providing educational and other services in a rural medical setting—that indeed, for formal educational purposes the television can be as effective as comparable classroom instruction. Also, the network may be of high value in promoting "best medical practice" by affirming practitioner judgments on case management and by encouraging the more widespread adoption of new practices already introduced to the rural medical community.

The study disclosed that different types of users get different benefits from the network. The medical centers use the network as a vehicle for service delivery and for faculty sharing. The local community hospitals derive status and needed information as participants in the network. They also feel that they gain the good will of the medical centers and have easy access to continuing education for their staffs. General practitioners find that the network offers them a low key, job relevant "break," and an opportunity to test their ideas with colleagues at other institutions. Specialists, on the other hand, welcome the network as an opportunity to maintain contact with physicians at other institutions.

Nurses, who have had more formal courses offered over the network, find that it offers them both knowledge and certification.

The first period of operation and construction of this network, from July 1970 through the fall of 1973, was devoted to exploring the uses and benefits of interactive television in a remote, rural area. The next two years will be devoted to testing the hypothesis that these uses and services can demonstrate cost benefits, to the point where they will assume a substantial portion of the costs of providing these communication links.

Computer Assisted Instruction Network

Since July 1972, the Lister Hill Center has been coordinating an experiment to foster the interinstitutional sharing of computer assisted instruction (CAI) resources among medical schools, hospitals, and other health related organizations (see *NLM Programs and Services* for FY 1972 and FY 1973). Three centers of biomedical CAI expertise were put on-line via a nationwide commercial time-sharing communications network. The three centers are Massachusetts General Hospital, Ohio State University College of Medicine and, until February of 1974, the University of Illinois at the Medical Center, Chicago. In 1974, some, but not all, of the UIMC programs were transferred to the Ohio State University computer so that they will continue to be available. The communications network is that of TYMSHARE, Inc.

Over 80 institutions (primarily medical schools) have used the network for a variety of purposes. These include: introducing CAI on campuses; integrating available materials into the curriculum; using the network as a supplement to other forms of training; using the material as a remedial tool; stimulating local CAI activities; and encouraging broader faculty use of the variety of educational resources available. User institutions have been encouraged to prepare "educational material use and evaluation plans" and to submit evaluative reports, which are shared with the others. About 70 percent of the CAI network's current use is by medical students. The remainder of the time is used primarily by physicians, nurses and allied health personnel. Total usages have ranged as high as 2,800 hours a month. An hour averages out to include 2.5 teaching sessions. Since there is a tendency for several students to group around the terminals and to interact as vigorously with each other as with the programs, it is probably conservative to estimate that the network has provided over 15,000 interactive teaching sessions per month.

Until February 1974, the Lister Hill Center absorbed most of the costs of the network. Users were required to provide suitable terminals, pay telephone charges to the nearest network connection point, and assume the cost of the necessary faculty time for administering the program. Starting February 1, 1974, users were required to pay $2.50 per connect hour; after

*Molly K. Hageboeck and Leon J. Rosenberg: *Interactive Television: A Study of Its Effectiveness as a Medical Education Resource in the Rural Northeast.* Practical Concepts, Inc. Washington, D. C. Nov. 1973. Available from National Technical Information Service, Springfield, Va., 22121, as PB 225172/6AS for $10.25 in hard copy or $2.25 in microfiche.

July 1, 1974, the charges rise to $5.00 per connect hour. These charges defray a portion of the total communications costs and do not reflect the computer and administrative costs paid to the several CAI centers. The remaining costs, about $13 per hour, will be borne by the Lister Hill Center for the duration of this phase of the experiment, which will be concluded May 30, 1975.

The network has demonstrated that schools are interested in sharing CAI materials for a variety of purposes; however, the present technical implementation of the network is too costly for the long run. Therefore, the Center is exploring alternative distribution methods, some of which may well involve an initial capital expenditure on the part of the using institutions, but which will result in substantially reduced operating costs. Computer language translation to permit wider distribution of materials, language standardization, and the use of minicomputers at local nodes or even at the campus end of the network, are all being studied. The goal is to encourage the exchange of educational materials prepared on other campuses while, at the same time, encouraging local institutions to maintain greater control in local modification of materials, encouraging local authoring, and keeping records of individual student performance out of central national computers. The Lister Hill Center will also maintain an active interest in the broader problems of resource sharing including: evaluation methodologies, content development issues such as copyright and author incentives, and helping faculty members learn how to use these new materials effectively.

Other Projects

A series of experiments in biomedical communications in the Pacific Basin using the ATS-1 satellite was concluded in August 1973. The University of Hawaii utilized the PEACESAT (Pan-Pacific Education and Communication Experiments by Satellite) experimental system made up of eleven satellite ground terminals in nine Pacific nations or jurisdictions. A large body of data was gathered identifying key individuals and agencies in the Pacific Basin and analyzing their needs for biomedical communications. Pilot demonstrations were conducted via satellite in administrative planning, diagnostic consulting, research, patient referrals, and training. Follow-on pilot health information systems are planned for the area, including a network for the exchange of library materials.

Also concluded in FY 1974 was a two and one-half year study supported by the Lister Hill Center to evaluate the effectiveness of individual access to audiotapes and 35mm slide material in freshman medical education at George Washington University. Students could borrow tapes of lectures (in either regular or "compressed speech" mode) and slide-tape programs in such subjects as histology, embryology, and neuroanatomy. Among the conclusions of the study were that the audiotaped materials were a significant support to learning for about 25 percent of the students and that 67 percent of these students considered the programs to be "very effective."

VII. INTERNATIONAL ACTIVITIES

International MEDLARS Cooperation

During this fiscal year the eight international bilateral *quid-pro-quo* agreements concerning MEDLARS have been renegotiated. The first step in this process was the second meeting of the International MEDLARS Policy Advisory Group. The meeting reviewed the nature of MEDLARS II/MEDLINE in terms of substantive and technical considerations; the schedule of NLM implementation; implications for non-U.S. centers; and alternate technical choices for the future. Particular emphasis was placed on an examination of the nature of future agreements based on operating experience and policy considerations.

Special discussions were held on the other NLM on-line data bases: CATLINE (monographs), SERLINE (serials), and TOXLINE (toxicology); review of journal coverage in MEDLARS/MEDLINE; assessment of the status of on-line systems and networking; interchange of information and people; technical cooperation and coordination; elimination of duplicate effort; and extension of services to other countries.

The major policy conclusion reached during the deliberations was that future cooperation should continue on the basis of a bilateral *quid-pro-quo* mechanism.

The alternatives available to the non-U.S. centers under the new MEDLARS agreements, with the selections made by the centers, are:

Tapes	Germany, Japan
Tapes + Software	Australia, Sweden
On-Line Access	France, Canada, WHO
Combination of Tapes plus On-Line Access	United Kingdom

Other actions and conclusions resulting from this Policy Meeting were: NLM requested suggestions for the development of international guidelines and criteria for journal selection and a list of journals based on these criteria; there should be an increase in the interchange of information and people; the extension of services beyond national boundaries is a matter of joint decision by the centers, with the knowledge and concurrence of the National Library of Medicine; the role of the World Health Organization will be primarily service to its technical staff, technical commissions, and to developing countries.

Attendees at this policy level meeting included:

AUSTRALIA	Mr. W.D. Richardson Assistant Director General, National Library of Australia
CANADA	Dr. Jack E. Brown National Science Librarian National Science Library National Research Council
FRANCE	Mr. A. Fonrojet Director, Administration and Finance, INSERM
GERMANY	Mr. H. Theisel Federal Ministry for Youth, Family Affairs & Health
SWEDEN	Professor S. Bergstrom Rektor, Karolinska Institutet
UNITED KINGDOM	Dr. H. Hookway Chief Executive, The British Library Board
WHO	Dr. T. Fulop, Acting Director, Health Manpower Development World Health Organization

plus Directors of the MEDLARS centers program and technical officials. NLM was represented by Mary E. Corning, Melvin S. Day, and Davis B. McCarn.

Pan American Health Organization

The NLM continued its technical consultation and backstopping for the Pan American Health Organization Regional Library of Medicine in Sao Paulo, Brazil (BIREME). An agreement was signed in January 1973 between the Atomic Energy Institute of Brazil, the Pan American Health Organization, and the National Library of Medicine for experimental use of MEDLINE in Brazil by BIREME for the provision of computerized bibliographic information services.

This MEDLINE experiment involves: the NLM which provides the data base, the computer program, and the training; the Atomic Energy Institute of the University of Sao Paulo, which is providing the computer time and operators; and BIREME for the provision of services. The operations are funded by the United Nations Development Fund. The results of this experimental project will determine how and when PAHO will be ready to enter into a *quid-pro-quo* arrangement with NLM similar to existing ones.

The overall objective of BIREME is to develop a degree of Latin self-sufficiency, not only in terms of BIREME itself, but in the strengthening of biomedical information resources at national levels. BIREME has become a model activity which is being examined by other nations and other organizations to determine its feasibility for application in other areas of the world.

A delegation of physicians and medical scientists from the Peoples Republic of China visited NLM on November 7, 1973. Dr. C. P. Li, formerly on the staff of NIH, shows the collection of ginseng materials he recently brought back from a visit to the Peoples Republic, with members of the delegation and Miss Mary Corning and Dr. Peter Olch of the NLM staff looking on.

US/USSR Discussions

Professor Yurii P. Lisitsyn, M.D., Director of the All-Union Research Institute for Medical and Medical-Technical Information, Ministry of Health, USSR, (VNIIMI) visited NLM at the request of Minister of Health Petrovsky and under the auspices of the US/USSR Agreement for Cooperation in the Field of Medical Science and Public Health.

A joint communique issued in September 1973 by the Secretary of the U.S. Department of Health, Education, and Welfare and the USSR Minister of Health included the statement that:

> "The Secretary and the Minister also agreed . . . to examine the possibility of sharing through computer terminals and otherwise the information assembled by the U.S. National Library of Medicine and the USSR Institute of Medical Information."

Discussions with Professor Lisitsyn included: MEDLARS/MEDLINE; unauthorized republication in the USSR of *Index Medicus;* vocabulary development and indexing; exchange of medical literature; and exchange of persons. These were all areas to be explored further by the Soviets.

With particular reference to the MEDLARS computer system, the USSR does not at this time have the computer hardware necessary to operate a system such as NLM's. A direct communication linkage between VNIIMI and the NLM computer in Bethesda would require sizable USSR expenditures to sustain the transmission linkage. Hence, this area of US/USSR biomedical cooperation is more appropriate in the long-range future. Any such collaboration would be consistent with the *quid-pro-quo* arrangements which NLM has with other countries.

Exchange Program and Services

NLM now has some 895 exchange partners in 85 countries throughout the world. Under these arrangements, the Library receives much material which otherwise would be difficult to obtain.

NLM continues to provide services to developing countries under a special arrangement with the U.S. Agency for International Development (AID). Under this program, we provide annually approximately 20,000 services to 48 developing countries throughout the world. These services

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meet a demonstrated need for those countries where modern medical information is unavailable because of inadequate library facilities, collection, and staff. These services cover interlibrary loans, reference requests, MEDLINE searches, subscriptions to *Index Medicus, Abridged Index Medicus,* and *Current Catalog.* The subject matter extends through all elements of health—research, education, and delivery of health care. The geographic distribution is approximately 51 percent to Latin America, 42 percent to the Near East, 4 percent to the Far East, and 3 percent to Africa. These data do not reflect total or absolute needs, but are reflections of actual requirements. In fact, our modest AID/NLM program is not able to respond totally to the existing inadequacies.

Public Law 480 Program

The Library's Special Foreign Currency Program, in support of the research and publication of scholarly projects in the health sciences, numbered 136 active projects in seven countries during fiscal year 1974. Twenty of these were new awards. Almost 68 percent of this program is carried out in Israel and Poland, with relatively few NLM projects active in Yugoslavia, Tunisia, Egypt, India, and Pakistan. During September 1973, two members of the NLM Board of Regents, Dr. W.N. Hubbard, Jr., and Dr. Jack Layton, and the Chief of NLM's International Programs Division, Dr. Jeanne Brand, made a site visit to Israel and Poland to evaluate the Library's programs in those countries. The Regents noted the benefits to U.S. science of NLM's support for critical reviews and monographs prepared by first-ranking scientists in countries with markedly different scientific settings, perspectives, and opportunities.

Israel

Although the Government's Public Law 480 program in Israel has been phased out, the Library's program in support of critical reviews in Israel will continue under a three-year award in FY 1974 from the U.S.-Israel Binational Science Foundation to the *Israel Journal of Medical Sciences.* Fifty-four NLM collaborative projects were active in Israel during FY 1974, eleven of which were new projects. The majority were critical reviews of biomedical research and practice, and proceedings of major international symposia in special health fields.

Poland

With the signing of the Memorandum of Understanding for Collaboration in the Health Sciences in 1973 by the U.S. Department of Health, Education, and Welfare and the Ministry of Health and Social Welfare of Poland, certain areas of health research were singled out with a view of achieving greater results from a concentration of efforts. In March 1974 these fields of emphasis were revised by mutual agreement and now include six broad areas: occupational and environmental health, rehabilitation, neurological and psychiatric disorders, health problems related to food and drugs, infectious diseases and the immune system, and the planning, delivery, and evaluation of health services. The Library sponsored the preparation of monographs in Poland in five of the six priority areas during FY 1974.

Appendix 4 lists twenty books and journal articles which were published during FY 1974 as a result of NLM foreign currency awards made in prior years.

International Organizations

NLM has varying degrees of involvement with a number of international organizations, both governmental and nongovernmental, scientific and nonscientific in character.

Government organizations include the United Nations; the UN specialized agencies which have a health or scientific orientation such as the World Health Organization (and PAHO) and the United Nations Education, Scientific, and Cultural Organization; economic organizations such as the Organization for Economic Cooperation and Development. Melvin S. Day, NLM Deputy Director, is the U.S. Member of the UNESCO/UNISIST Advisory Committee of the U.N. Environmental Program International Referral Service, and Chairman of the Organization for Economic Cooperation and Development (OECD) Environmental Information Panel. Dr. Martin M. Cummings, NLM Director, is serving as a special consultant to the World Health Organization in its development of a broad program plan in biomedical communications. Miss Corning represented the Director at the meeting of the PAHO Scientific Advisory Committee for its Regional Library of

Medicine which serves as the policy body for BIREME.

The NLM is a member of the International Council of Scientific Unions Abstracting Board (ICSU AB). Representing the Library at the 1973 meetings were Dr. Cummings and Miss Corning. Topics discussed included the activities of the member unions and member services, the international serials data system, UNISIST, the ICSU AB reference manual, and development of bibliographic standards.

A paper was presented on *The Role of the United States Government in Information Transfer* by Miss Corning as part of a panel including Jacques Michel, Comte National de Documentation Scientifique et Technique (CNIDST), and John C. Gray, Office for Scientific and Technical Information (OSTI).

Appendix 1

FY 1974 Publications Available from GPO

	Number Printed for Sale (per issue)
Abridged Index Medicus	4,700
Bibliography of the History of Medicine	3,000
Cumulated Abridged Index Medicus	2,000
Cumulated Index Medicus	5,000
Current Bibliography of Epidemiology (Annual)	750
Current Bibliography of Epidemiology (Monthly)	1,000
Index Medicus	9,200
International Bibliography of the History of Legal Medicine	1,500
List of Journals Indexed in Index Medicus	3,500
Medical Subject Headings	10,000
Monthly Bibliography of Medical Reviews	1,100
NLM Current Catalog (Annual)	1,600
NLM Current Catalog (Quarterly)	1,600
National Medical Audiovisual Center Catalog	12,500
A Profile of the U.S. Public Health Service	1,000
Selected References on Environmental Quality as It Relates to Health	1,000
Toxicity Bibliography	850

Appendix 2

Staff Bibliography

The following represent published articles or chapters of larger works by National Library of Medicine authors in fiscal year 1974:

Brooke, M. L., Bell, R. W., and Oppenheimer, M. J.: A team approach to developing an audiovisual single-concept instructional unit. *The Physiology Teacher.* 3: 8-13, 1974.

Cassedy, J. H.: Edwin Oakes Jordan. In *Dictionary of Scientific Biography.* New York: Scribner's, Vol. 7, 1973, pp. 170-171.

Corning, M. E.: The role of the United States Government in information transfer. In *Proceedings of the Full Board Meeting, International Council of Scientific Unions Abstracting Board.* London, July 1973, pp. 87-120.

Day, M. S.: Computer-based retrieval services at the National Library of Medicine. *Federation Proceedings.* 33: 1717-1718, 1974.

Day, M. S.: Restoring the library ecology through networks. In Kent, A. (Ed.): *Resource Sharing in Libraries: Why. How. Next Action Steps.* New York: Marcel Dekker, Inc., 1974, pp. 259-265.

Krivatsy, P.: Nicola Massa's Liber de Morbo Gallico—dated 1507 but printed in 1527. *J. Hist. Med.* 29: 230-233, April 1974.

Krivatsy, P.: Erasmus' medical milieu. *Bull. Hist. Med.* 47: 113-154, 1973.

McCarn, D.B.: Network—or all hang separately. In Lancaster, F. W. (Ed.): *Proceedings of the 1973 Clinic on Library Applications of Data Processing: Networking and Other Forms of Cooperation.* Urbana-Champaign, Illinois, University of Illinois, Graduate School of Library Science, 1973, pp. 1-8.

McCarn, D.B.: A medical information network and constraints on networking.

In Greenberger, Martin (Ed.): *Networks for Research and Education: Sharing Computer and Information Resources Nationwide.* Cambridge, Massachusetts: MIT Press, 1974, pp. 338-344.

McCarn, D. B. and Leiter, J.: On-line services in medicine and beyond. *Science.* 181: 318-324, 1973.

Nemec, J.: *International Bibliography of the History of Legal Medicine.* Bethesda, Maryland: National Library of Medicine, 1973, 224 pp.

Richmond, J. S., comp.: *Medical Reference Works 1679-1966; a Selected Bibliography.* Suppl. 2, 1969-1972. Chicago: Medical Library Association, 1973, 174 pp.

Schoolman, H. M.: The copyright war. The library. *Current Medical Dialog.* 41: 233-234, 1974.

Waserman, M. J.: Dr. Zuriel Waterman, an itinerant surgeon in the Revolutionary era. *Proc. Am. Phil. Soc.* 117: 338-403, 1973.

Wooster, H. and Lewis, J. F.: Utilization of the Lister Hill Center computer assisted instructional experimental network. *Comput. Med.* 3 (9): Unpaged Special Report, September 1973.

Wooster, H. and Lewis, J. F.: Distribution of computer-assisted instructional materials in biomedicine through the Lister Hill Center experimental network. *Comput. Biol. Med.* 3: 319-323, 1973.

Appendix 3

Grant Supported Publications

Altschul, Siri von Reis. *Drugs and Foods from Little Known Plants. Notes in Harvard University Herbaria.* Cambridge: Harvard University Press, 1973, xii, 366 pp.

Chester, Edward M. *The Ocular Fundus in Systemic Diseases.* Cleveland, Ohio, Case Western Reserve University, 1973, 244 pp.

Dayhoff, Margaret O., ed. *Atlas of Protein Sequence and Structure.* vol. 5, Supplement I. National Biomedical Research Foundation, Georgetown University Medical Center, Washington, D. C., 1973, 114 pp.

———. *Protein Segment Dictionary.* National Biomedical Research Foundation, Georgetown University Medical Center, Washington, D. C., 1973.

Forbes, Thomas R. Medical supplies for prisoners in 1675. *Bulletin of the New York Academy of Medicine,* 2d series, vol. 49, no. 7, 1973, pp. 592-593.

———. London coroners' inquests for 1590. *Journal of the History Medicine and Allied Sciences,* vol. 28, no. 4, Oct. 1973, pp. 376-386.

Greenbaum, Louis S. "Jean-Sylvain Bailly, the Baron de Bretuil and the four new hospitals of Paris," *Clio Medica,* vol. 8, no. 4, 1973, pp. 261-284.

Howard, R. Palmer and Gideon, Rose C. The beginning of medical organization in Oklahoma, 1889-1893. *Journal of the Oklahoma State Medical Association,* vol. 67, no. 2, February 1974, pp. 43-54.

Index-Catalogue of Medical and Veterinary Zoology, Special Publication No. 3, Ticks and Tickbourne Diseases, U. S. Government Printing Office, Washington, D. C., 1974.

International Journal of Systematic Bacteriology. Official Organ of the Association of Microbiological Societies. vol. 23, nos. 3-4, July-October, 1973.

Journal of Medical Entomology. Honolulu, Hawaii: B. P. Bishop Museum, Entomology Department, vol. 11, no. 1, March 28, 1974, pp. 1-45.

Kerker, Ann E. and Murphy, Henry T. *Comparative and Veterinary Medicine;*

A Guide to the Resource Literature. Madison, Wis.: The University of Wisconsin Press, 1973, 308 pp.

Medi-Kwoc Index. An Index to the Published Proceedings of Conferences and Symposia on Biomedicine. St. Louis; Washington University School of Medicine Library, vol. 1, no. 3, 1973; vol. 2, no. 2, 1974.

Nomina Histologica, Revision of the 1970 Leningrad version. Federation of American Societies for Experimental Biology. Bethesda, Md., July, 1973, 56 pp.

Siegel, Rudolph. *Galen on Psychology, Psychopathology, and Function and Diseases of the Nervous System.* Basel: Karger, 1973, 310 pp.

Smith, Hobart M. and Smith, Rozella B. *Synopsis of the Herpetofauna of Mexico. Vol. II: Analysis of the Literature Exclusive of the Mexican Axolotl.* Augusta, West Va.: Eric Lundberg, 1973, 367 pp.

Smith, Rozella B., and Smith, Hobart M. Nominal taxa of recent amphibians and reptiles, I Gymnopliona. *Transactions of the Kansas Academy of Science.* vol. 75, no. 1, 1972, pp. 52-99.

Smith, Hobart M.; Sinelnik, George; Fawcett, James D.; and Jones, Richard E. A survey of the chronology of ovulation in anoline lizard genera. *Ibid,* vol. 75, no. 2, 1972, pp. 107-120.

Smith, William O. The development of American medical research and the influence of John D. Rockefeller. *Journal of the Oklahoma State Medical Association,* vol. 67, no. 4, April 1974, pp. 146-155.

Sollers-Riedel, H. Cumulative bibliography 1953-1972. Parasites, predators, viruses and related agents. *Mosquito News;* Journal of the American Mosquito Control Association, vol. 33, no. 2, 1973, pp. 301-17.

_____ Literature references to mosquitoes and mosquito-borne diseases. Part II. *Mosquito News;* Journal of the American Mosquito Control Association, vol. 33, no. 2, 1973, and following.

Swindler, D. R., and Wood, Charles D. *An Atlas of Primate Gross Anatomy: Baboon, Chimpanzee and Man.* Seattle, University of Washington Press, 1973, 370 pp.

Warren, Kenneth S. *Schistosomiasis: The Evolution of a Medical Literature: Selected Abstracts and Citations, 1852-1972.* Cambridge, Mass., The Massachusetts Institute of Technology, 1973, 1073 pp.

Appendix 4

PL-480 Supported Publications

Bachrach, Uriel. *Function of Naturally Occurring Polyamines.* New York: Academic Press, 1973, 211 pp.

Becker, Yechiel. *The Agent of Trachoma* (Monographs in Virology, vol. 7). Basel, Switzerland: S. Karger, 1974, 99 pp.

Beutner, E. H., Chorzelski, T. P., Bean, S. F., and Jordan, R. E. (eds.). *Immunopathology of the Skin: Labeled Antibody Studies.* Stroudsburg, Pa.: Dowden, Hutchinson and Ross, 1973, 461 pp.

Blum, J. J., and Lubliner, J. Biophysics of flaggelar motility. *Annual Review of Biophysics and Bioengineering,* vol. 2, 1973, pp. 181-219.

Bogatyrev, I. D. *Morbidity of Urban Populations and Standards of Therapeutic-Prophylactic Care.* Translated by E. Adelson and N. Kaner. Jerusalem: Israel Program for Scientific Translations. New York: The American

Public Health Association, 1974, 401 pp.
Carmon, Amiram; Gutman, Yehuda; and Werman, Robert (eds.). The neural basis of memory and learning. Pharmacological aspects of brain research. *Israel Journal of Medical Sciences*, supplement to vol. 9, 1973, 124 pp.
Eliakim, M. (ed.). International symposium on hepatotoxicity. *Israel Journal of Medical Sciences*, vol. 10, no. 4, April 1974, pp. 285-461.
Gatt, Shimon. Inhibitors of enzymes of phospholipid and sphingolipid metabolism. *Metabolic Inhibitors*, vol. 4, New York: Academic Press, 1973, pp. 349-387.
Gatt, Shimon and Barenholz, Yechezkel. Enzymes of complex lipid metabolism. *Annual Review of Biochemistry*, vol. 42, 1972, pp. 61-90.
Gedalia, Itzhak, and Zipkin, I. *The Role of Fluoride in Bone Structure.* St. Louis, Mo.: Warren H. Green, 1973, 40 pp.
Jeras, J. and Tivadar, I. *Epilepsies in Children.* Hanover, New Hampshire: The University Press of New England, 1973, 143 pp.
Kahlbaum, K. L. *Catatonia.* Translated by Y. Levij, and T. Pridan, Jerusalem: Israel Program for Scientific Translations. Baltimore, Md.: The Johns Hopkins University Press, 1973, 102 pp.
Lis, Halina, and Sharon, Nathan The biochemistry of plant lectins (phytohemagglutinins). *Annual Review of Biochemistry*, vol. 42, 1973, pp. 541-574.
Padan, Etana, and Shilo, Moshe. Cyanophages—viruses attacking blue-green algae. *Bacteriological Reviews*, September 1973, pp. 343-370.
Polish Research Guide. Warsaw: Polish Scientific Publishers, 1974, 638 pp.
Prywes, Moshe and Helevi, H. S. (eds.). Proceedings of the Batsheva seminar on health administration and health economics. *Israel Journal of Medical Sciences*, vol. 10. nos. 1-2, January-February 1974, 179 pp.
Rabinowitz, David and Merrimee, Thomas J. Isolated human growth hormone deficiency and related disorders. *Israel Journal of Medical Sciences*, vol. 9, Nos. 11-12, November-December 1973, pp. 1599-1657.
Ramot, Brach (ed.). Genetic polymorphisms and diseases in man. *Israel Journal of Medical Sciences*, vol. 9, nos. 9-10, September-October 1973, pp. 1129-1533.
Razin, Shmuel. Physiology of mycoplasmas. *Advances in Microbial Physiology*, vol. 8, 1973, pp. 1-80.
Yoffey, Joseph M. *Bone Marrow in Hypoxia and Rebound.* Springfield, Illinois: Charles C. Thomas, 1973, 276 pp.